

This data is the first release of retrieved XCO₂ from GOSAT data by the ACOS project for preliminary evaluation by the broader community beyond the immediate ACOS team. The analysis looks only at land scenes.

An initial data validation has been performed with the ACOS version 2.7 data. The data were compared to TCCON ground-based measurements at 8 different sites ranging in latitude from 47° N to 45° S. From this preliminary analysis, it has been determined that the ACOS XCO₂ retrievals are biased 7.7 ppm lower (1.7 ppm standard deviation) than that measured by TCCON. The bias shows some variation with latitude and season but is between -6.5 and -8.7 ppm for each of the 8 stations. The data used in the comparisons is a zonal, monthly average and using 10 degree latitude bins. The current bias results in ACOS XCO₂ retrieved values that are lower than those measured at TCCON by ~2%. Preliminary analysis has also shown that the ACOS retrieved surface pressure is typically 10 hPa higher than the ECMWF product. This high estimate of surface pressure accounts for roughly half of the low bias in XCO₂.

In comparisons with TCCON data and analysis of a large selection of the ACOS dataset, it is seen that the ACOS data display a significantly higher level of variability than is expected for XCO₂. The large variability continues to be investigated

The ACOS v2.7 data product is still being improved and validation analysis is ongoing. The priority of future releases of ACOS data will be to reduce the biases and other error terms in the XCO₂ product. A more detailed estimate of biases relative to the TCCON network will also be provided with future releases.